

JOANNA COLE & BRUCE DEGEN

The Magic School Bus

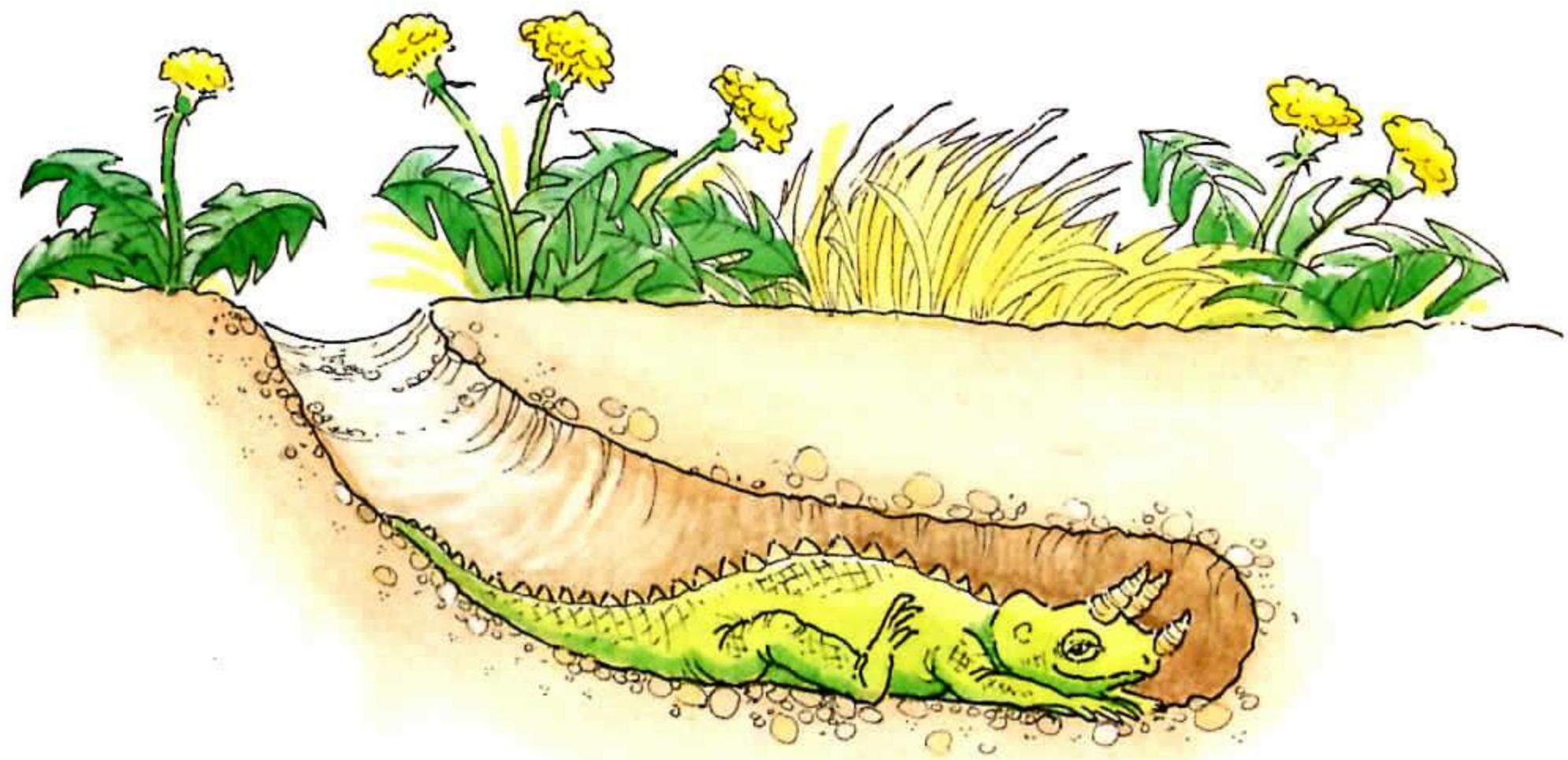
Inside the Earth



SCHOLASTIC

The Magic School Bus

Inside the Earth



TSWSI

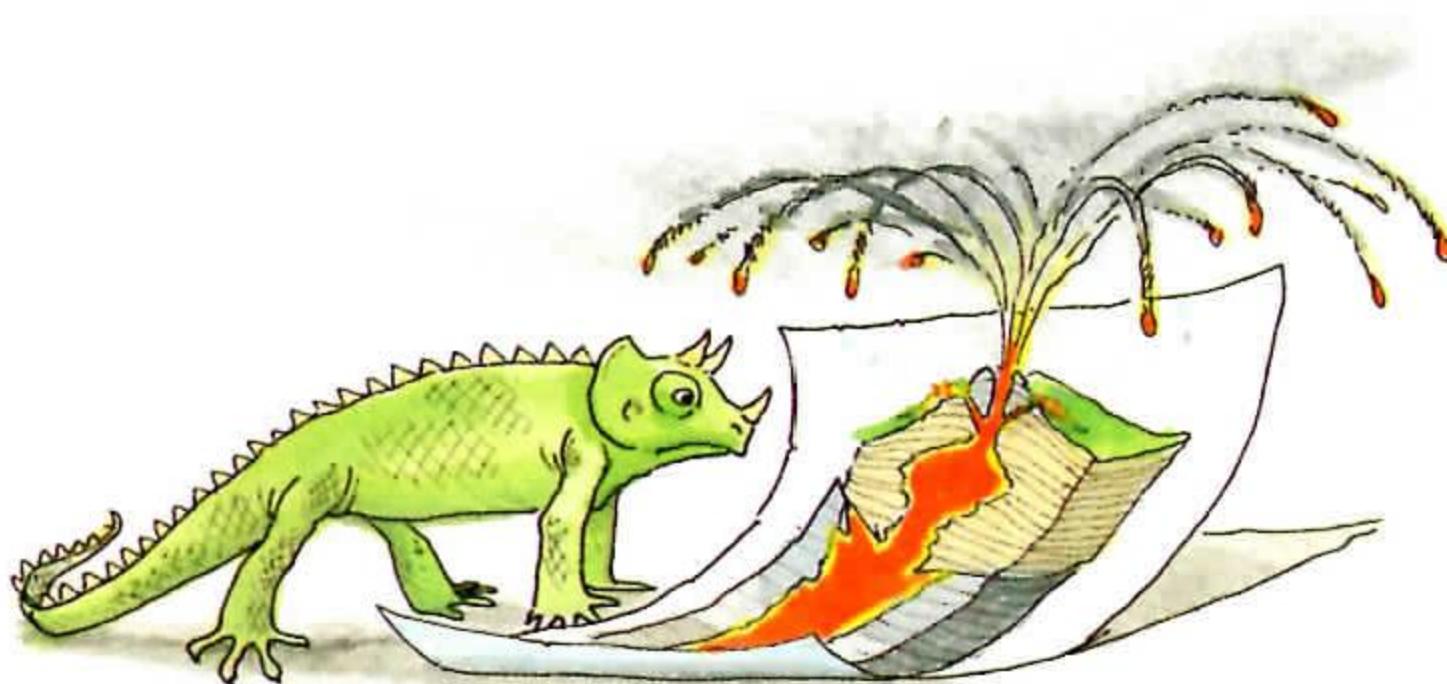


The Magic School Bus

Inside the Earth

By Joanna Cole

Illustrated by Bruce Degen



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IT'S YOUR TURN TO
BE THE ANT MONITOR,
ARNOLD

BEEHIVE

THE ANT
MONITOR??

IS IT ALWAYS
LIKE THIS IN,
MS. FRIZZLE'S
CLASS?

YOU'LL GET
USED TO IT.

Ant Farm

MOUSE HOLE

Ant FOOD

NEW
KID

OWL'S
Nest

PAPER WASP
NEST

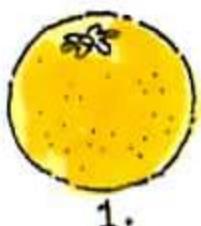
In Ms. Frizzle's class,
we had been learning about
animals' homes
for almost a month.
We were pretty tired of it.
So everyone was happy
when Ms. Frizzle announced,
"Today we start something new."

SOMETHING NEW.
THANK GOODNESS!

GET OFF!



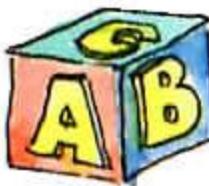
CHALLENGE OF THE WEEK:
WHICH ONE IS THE EARTH?



1.

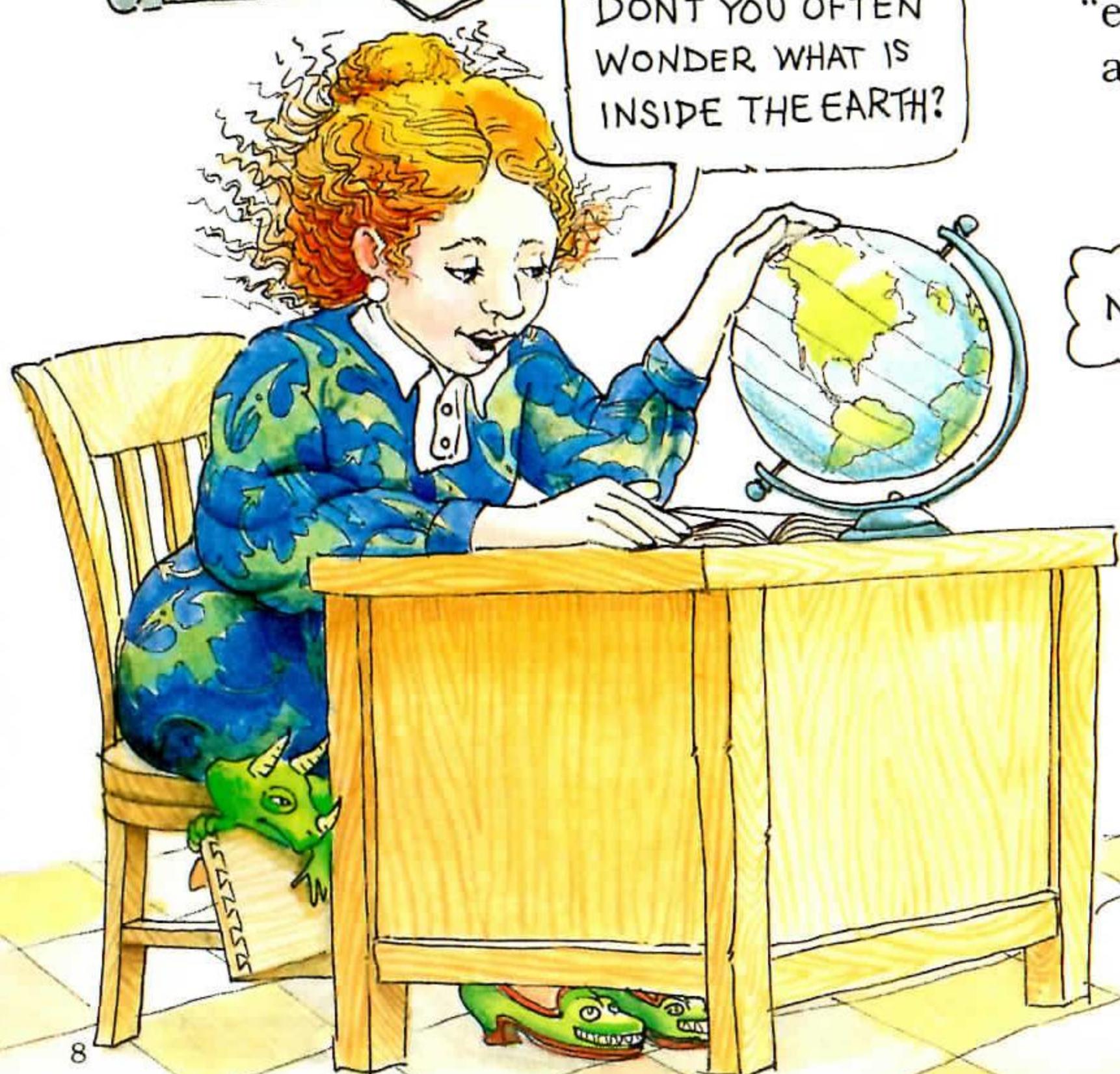


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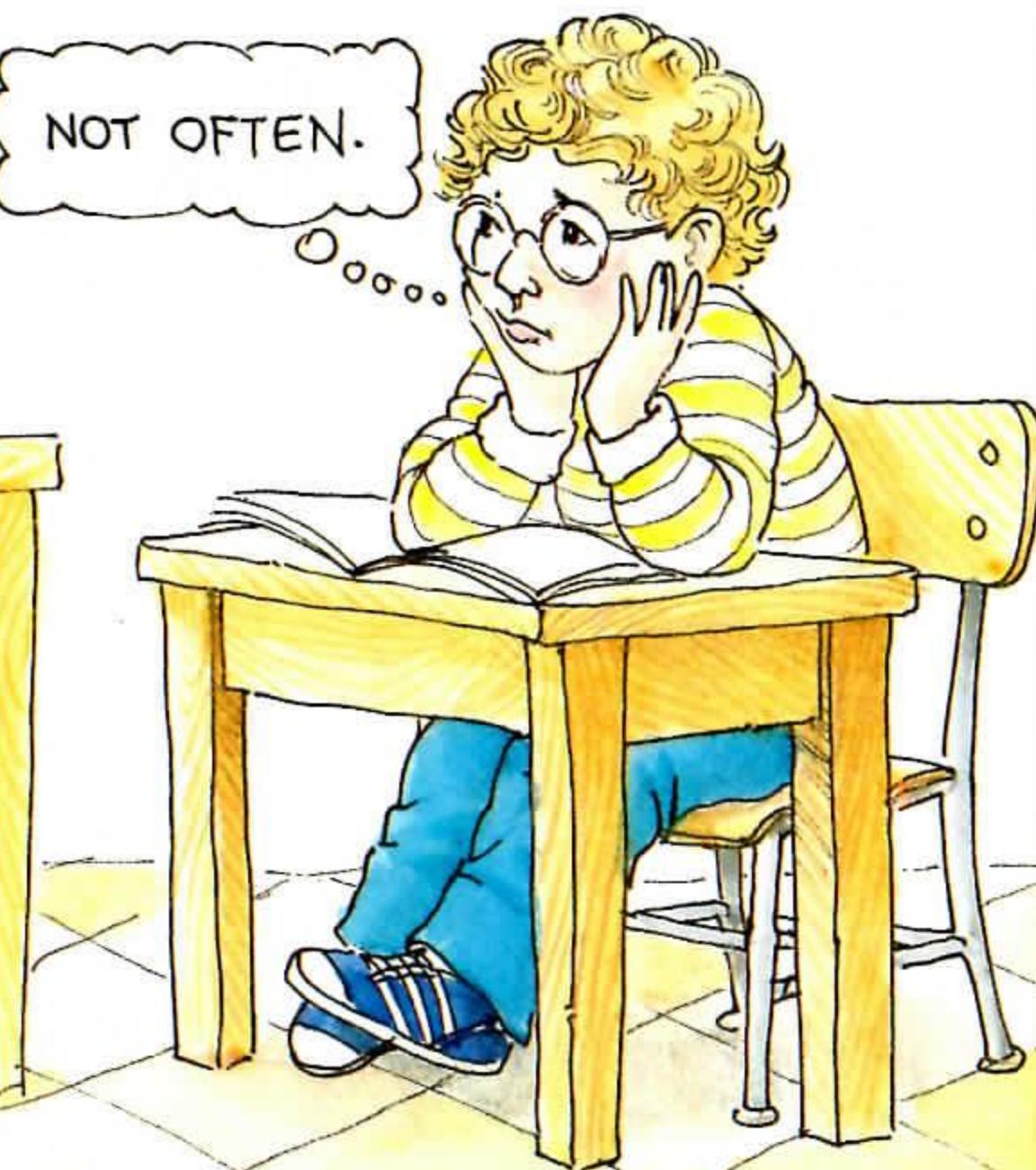


3.

DON'T YOU OFTEN
WONDER WHAT IS
INSIDE THE EARTH?



"We are going to study
about our earth!" said Ms. Frizzle.
She put us to work
writing reports
about earth science.
"And for homework,"
she said,
"each person must find a rock
and bring it to school."



But the next day,
almost everyone had
some excuse.

I COULDN'T FIND
ANY ROCKS.

I FOUND ONE,
BUT MY DOG
ATE IT.

YOUR DOG
ATE A ROCK?



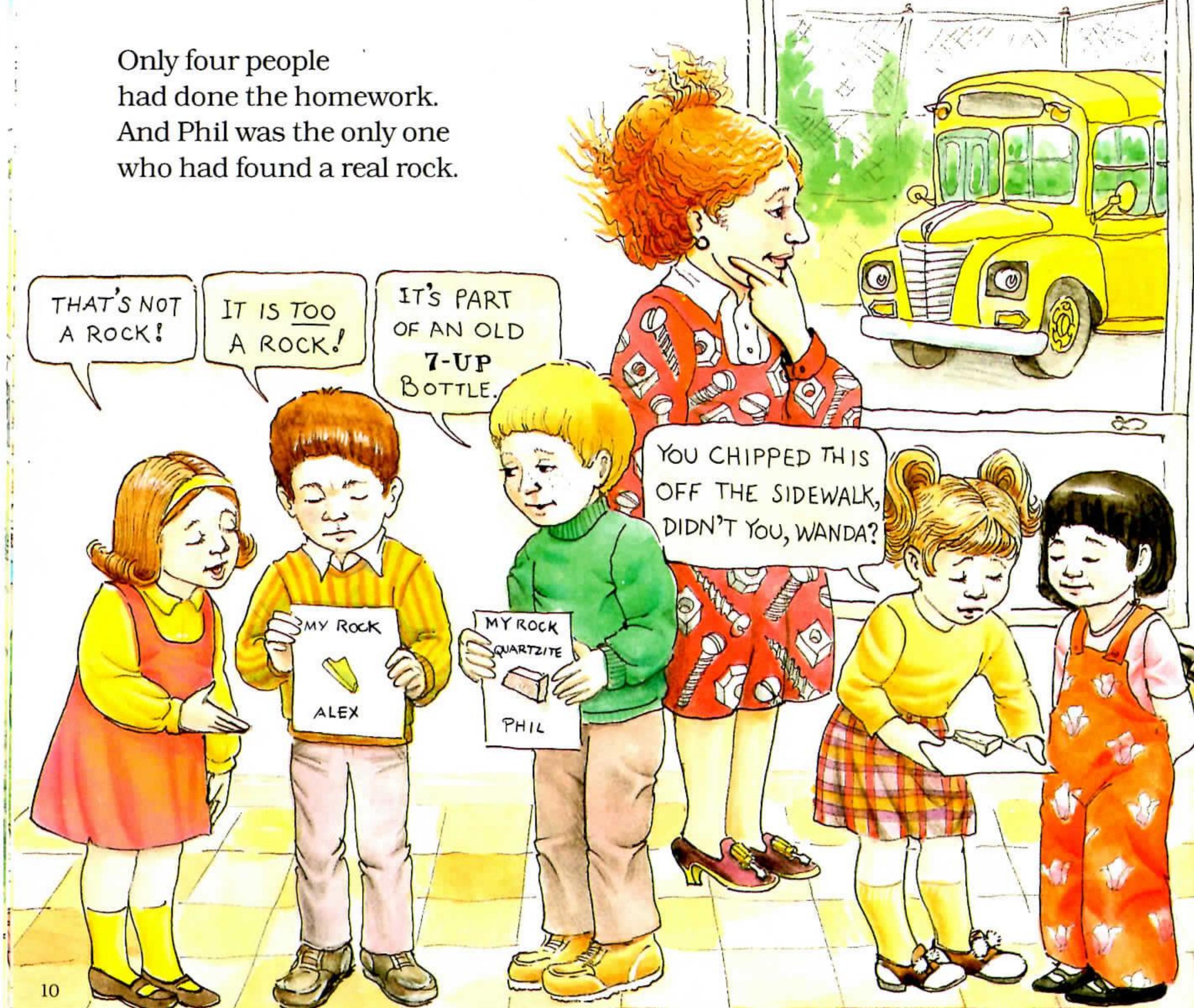
WHERE DO ROCKS
COME FROM? by Wanda

Most of the solid
part of the earth is
made of great masses
of rock.

The small rocks that
we collect are just
pieces that broke off
from these huge masses.



Only four people
had done the homework.
And Phil was the only one
who had found a real rock.



"I guess we'll have to go on a field trip and collect rocks," said Ms. Frizzle.

ARNOLD, THAT LOOKS LIKE STYROFOAM TO ME.

IT COULD BE A STALE CUPCAKE.

YEAH, COVERED WITH DIRT.

YOU ACTUALLY TOUCHED THIS, ARNOLD?



o WHAT ARE ROCKS MADE OF?
by Tim

Rocks are made of minerals. Sometimes you see tiny specks of different colors in a rock. Sometimes you see shiny specks. These different specks are the different minerals that make up the rock.



You never know
what will happen
on a trip with Ms. Frizzle.
Her new dress
was a trip in itself.
At first the old school bus
wouldn't start.
But finally we were on our way.

I CAN'T BELIEVE
MS. FRIZZLE
DRESSES LIKE THAT.

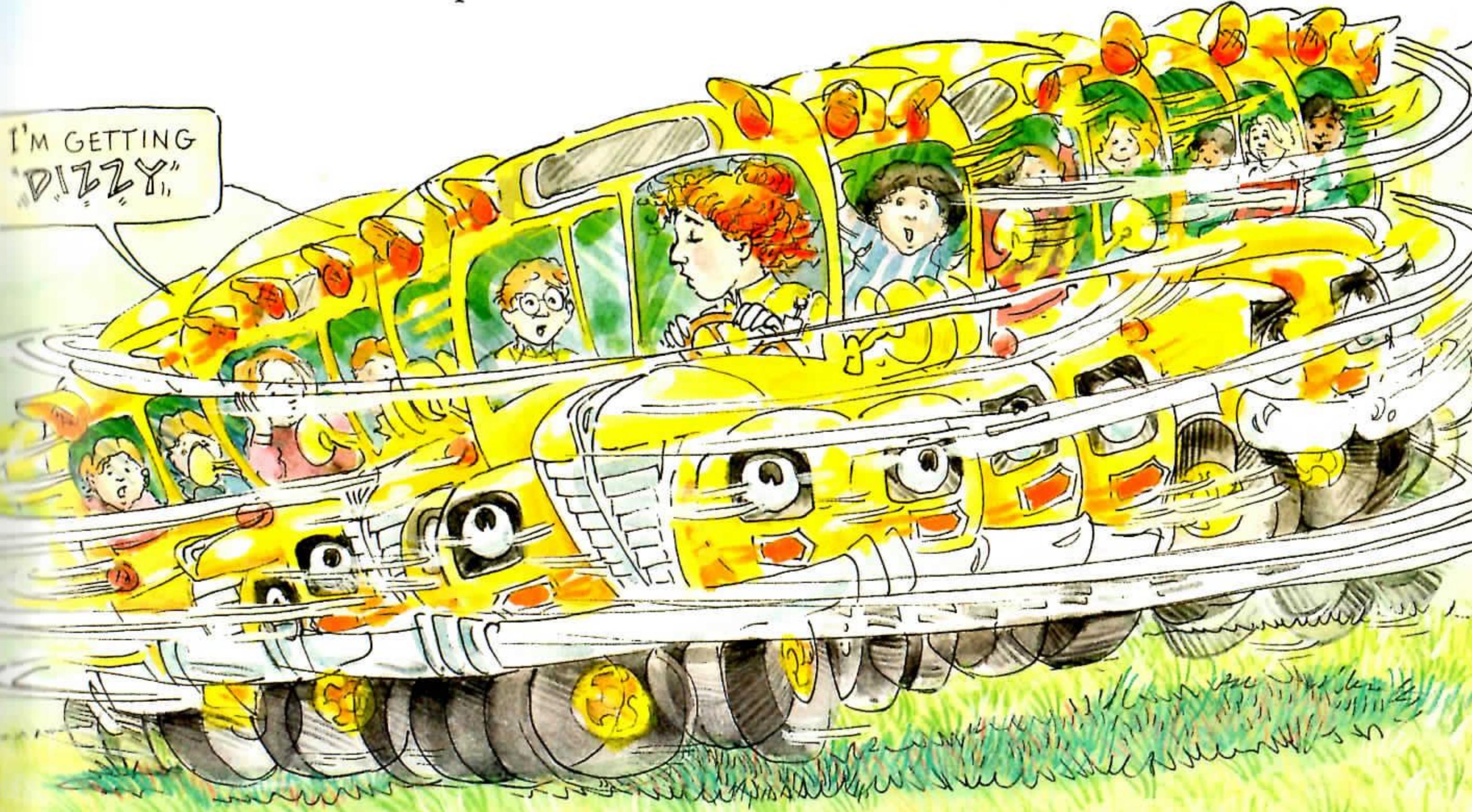
YOU'LL GET
USED TO IT.



When we came to the field,
all the kids wanted
to get out of the bus.
But suddenly,
the bus began to spin like a top.
That sort of thing doesn't happen
on most class trips.

FASTEN THOSE
SEAT BELTS,
CHILDREN.

MS. FRIZZLE,
WHEN CAN WE
COLLECT ROCKS?



THE EARTH'S CRUST by John

- The outside of the earth is a shell of hard rock and soil. This shell is called the earth's crust.



THIS CRUST IS
AS HARD AS
A ROCK, TOO.

THIS ISN'T EXACTLY EASY.

AT LEAST WE'RE
MISSING SPELLING.

When the spinning finally stopped, some things had changed. We all had on new clothes. The bus had turned into a steam shovel. And there were shovels and picks for every kid in the class. "Start digging!" yelled Ms. Frizzle. And we began making a huge hole right in the middle of the field.



FIRST, WE WILL DIG
THROUGH THE EARTH'S
CRUST. THE TOP LAYER
OF THE CRUST IS SOIL.

IT LOOKS LIKE
DIRT TO ME.

DIRT IS ANOTHER
WORD FOR SOIL.

OH, GREAT! NOW SHE
CAN READ MY MIND!



WHAT IS SOIL?

by Florrie

Soil is made of ground-up
rock, mixed with clay, bits
of dead leaves, sticks,
and small pebbles.

Without rock there
would be no soil for
plants and trees to
grow in.

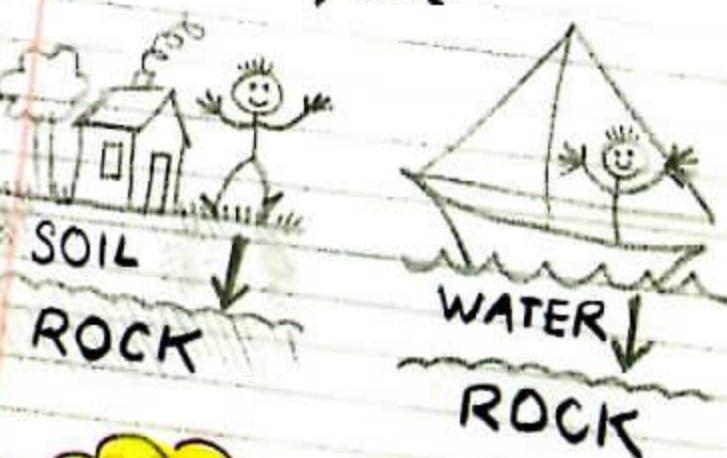


THERE IS ALWAYS
ROCK UNDER YOU
by Shirley

- Most of the rock in the earth's crust is covered with soil or
- water. But if you dig deep enough, you will find the rock.

- Wherever you are
- standing or walking or floating on earth...

there is rock under you.



Before long—CLUNK!—we hit rock. The Friz handed out jackhammers. We began to break through the hard rock.



“Hey, these rocks have stripes,” said a kid.

Ms. Frizzle explained that each stripe was a different kind of rock.

MILLIONS OF YEARS AGO,
THESE ROCKS WERE
FORMED IN LAYERS.

THIS TAN ROCK IS
CALLED SANDSTONE.

THIS GRAY STRIPE
IS SHALE.

THIS WHITE ROCK
IS LIMESTONE.

LAYERS-HMM,
LIKE A CAKE.

DON'T TRY
TO EAT IT!



HOW ROCK LAYERS

WERE FORMED

by Molly

Millions of years ago,
wind blew dust and sand
into lakes and oceans.

- The dust and sand
settled to the bottom in
layers called sediment.
Seashells formed layers
of sediment, too.

- Over time, the layers
hardened into the sedimentary
rock we see today.

AN EARTH SCIENCE WORD

by Dorothy Ann

Sedimentary comes
from a word that
means "to settle."

We chipped off pieces of the rocks
for our class rock collection.

"These rocks are called
sedimentary rocks, class,"
said Ms. Frizzle.

"There are often fossils
in sedimentary rocks."

SANDSTONE IS MADE
OF GRAINS OF SAND
ALL PRESSED TOGETHER.

SHALE IS MADE OF
MUD AND CLAY
ALL PRESSED TOGETHER.

SANDSTONE
FEELS
GRAINY.

THIS SHALE HAS
A FOSSIL OF A
LEAF IN IT.



THIS LIMESTONE
HAS A FOSSIL OF
A SEASHELL IN IT.

THAT'S BECAUSE LIMESTONE
IS MADE OF SHELLS
ALL PRESSED TOGETHER.

MILLIONS OF YEARS AGO,
THERE WAS A SEA HERE.

WHY THERE ARE FOSSILS IN ROCK LAYERS

by Phoebe

Sometimes a prehistoric plant or animal died and was buried in layers of mud, sand, or crushed shells. Then it turned to rock along with the layers. It became a fossil.





I'LL NEVER
GET USED
TO THIS.

Wouldn't you know it?
Just when we were finding
lots of fossils,
Ms. Frizzle said,
"Back on the bus, kids."
Then, as we were driving along,
we heard rock crumbling underneath us.
Down we went.
Everything was pitch black.
And we were falling, falling, falling!



CLASS, WE'RE NOW GOING
DEEPER INTO THE EARTH.

I'D RATHER BE
GOING BACK TO SCHOOL.
(I CAN'T BELIEVE I
SAID THAT!)

WE'RE FALLING!

HELP!

WA-A-AA



We landed with a bump.

Ms. Frizzle switched on the headlights.

We had fallen through a hole
into a huge limestone cave.

“Rain water has been dripping down
through the earth for ages,”
said Ms. Frizzle.

“The water wore away this cave
in the rock.”

THIS WHOLE CAVE IS
MADE OF LIMESTONE.
CAN YOU FIND MORE
FOSSILS HERE?

HERE'S ONE,
MS. FRIZZLE.

KNOCK IT OFF!

22

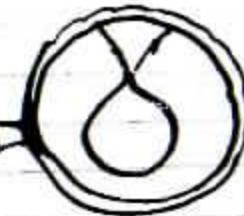
THE EMPIRE STATE
BUILDING IS MADE
OF LIMESTONE TOO.

We wanted to stay for a while,
but suddenly, the bus sprouted a drill.
It started boring through the rock.
Frizzie shouted, "Follow that bus!"
And down we went.



How STALAGMITES AND STALACTITES ARE FORMED by Phil

- Shapes that look like cones and icicles are formed in caves by dripping water that contains tiny invisible bits of limestone.



HOW TO REMEMBER WHICH IS WHICH:

- The word stalagmite has a 'g' for ground.
- The word stalactite has a 'c' for ceiling.

C

G



o ANOTHER EARTH SCIENCE WORD
by Dorothy Ann

Metamorphic comes from a word that means "to change."

I DIDN'T KNOW ROCKS COULD CHANGE.

IT TAKES MILLIONS OF YEARS.

The farther down we went, the hotter it got.

The rocks were harder, too.

"These are rocks that were changed from one kind to another kind by heat and pressure,"

explained The Friz.

"Rocks that were changed are called *metamorphic* rocks."

THIS BEAUTIFUL MARBLE USED TO BE LIMESTONE.

THEY MAKE STATUES OUT OF MARBLE.

LOMESTONE + HEAT + PRESSURE + TIME = MARBLE



THIS ROCK USED TO BE SHALE.
IT WAS CHANGED TO SLATE.

SLATE IS HARDER
THAN SHALE.

THIS ROCK
IS VERY HARD.

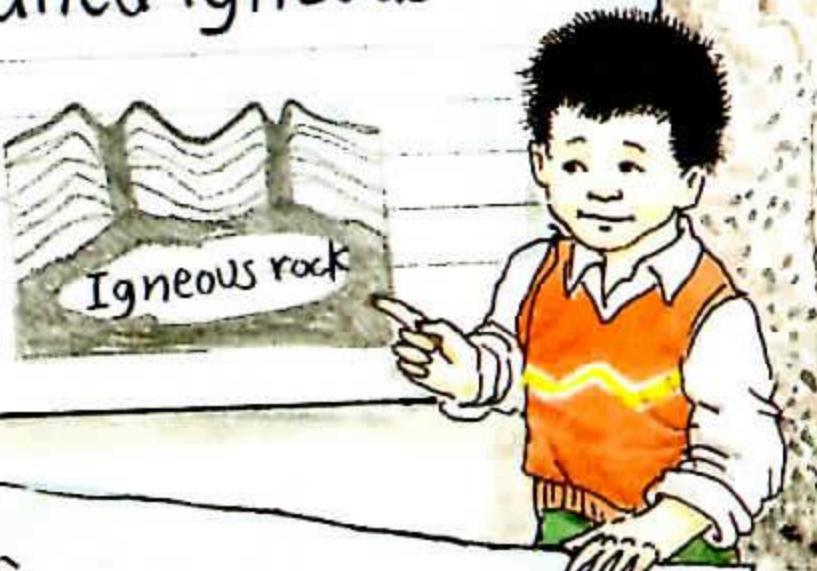
KNOCK
KNOCK

CUT IT
OUT!



HOW IGNEOUS ROCKS WERE FORMED by Michael

- Melted rock can push up through cracks in the earth's crust.
- When the melted rock cools and hardens, it is called igneous rock.



STILL ANOTHER EARTH SCIENCE WORD

by Dorothy Ann

Igneous comes from a word that means "fire".

- The heat inside the earth is like fire.

It can melt rocks.

We went down even farther toward the center of the earth.

We hit rock that was formed billions of years ago from a pool of melted rock under the earth's surface. Rock like this is called *igneous* rock.

THIS IGNEOUS ROCK
IS CALLED GRANITE.
MANY BUILDINGS AND
MONUMENTS ARE
MADE OF GRANITE.

ARNOLD, WILL YOU
CARRY THESE
SAMPLES?

EARTH SCIENCE
IS HEAVY, MAN.

I NEVER
KNEW ROCKS
COULD MELT!





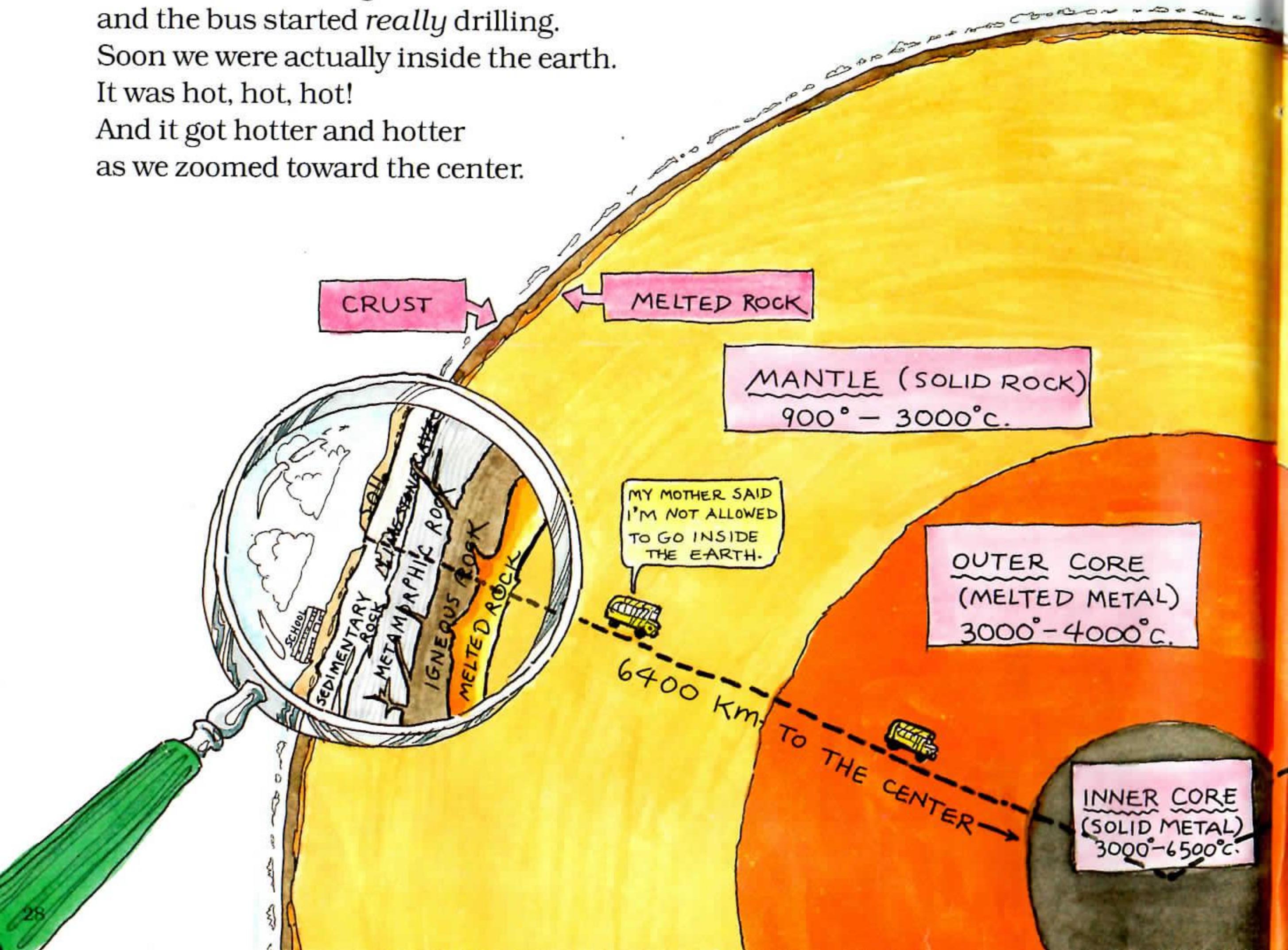
We had dug all the way through the earth's crust. It was so hot now that Ms. Frizzle told us to get back in the bus.

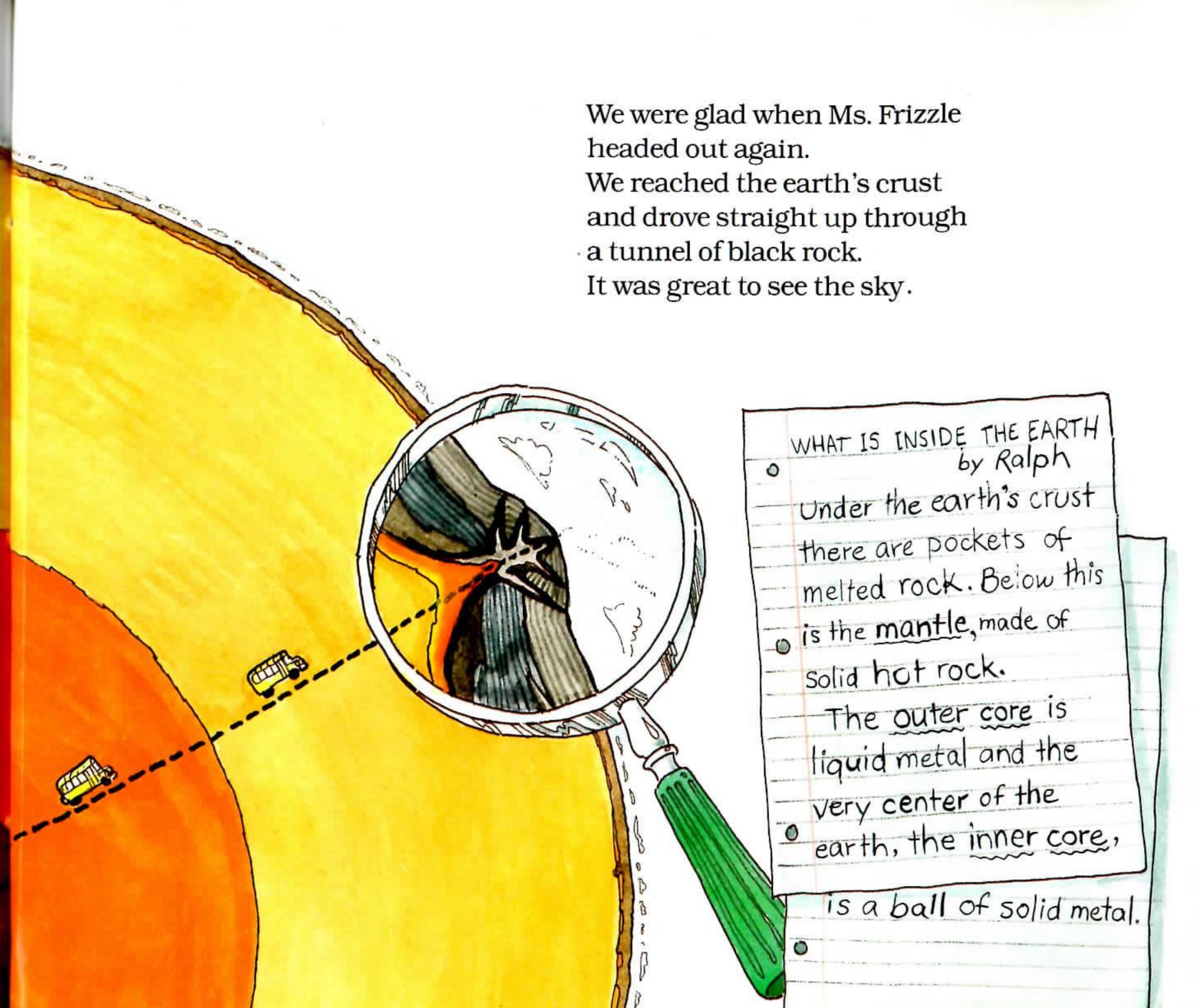
WE'RE LUCKY
THE BUS IS AIR-
CONDITIONED.

WHAT IS YOUR
FAVORITE ROCK?

ROCK 'N'
ROLL!

She stepped on the gas,
and the bus started *really* drilling.
Soon we were actually inside the earth.
It was hot, hot, hot!
And it got hotter and hotter
as we zoomed toward the center.





We were glad when Ms. Frizzle headed out again.

We reached the earth's crust and drove straight up through a tunnel of black rock.

It was great to see the sky.

WHAT IS INSIDE THE EARTH
by Ralph

Under the earth's crust there are pockets of melted rock. Below this is the mantle, made of solid hot rock.

The outer core is liquid metal and the very center of the earth, the inner core,

is a ball of solid metal.

WHAT IS A VOLCANO?

by Rachel

o A volcano is an opening in the earth's crust where melted rock can flow out.

Volcanoes come in different shapes:

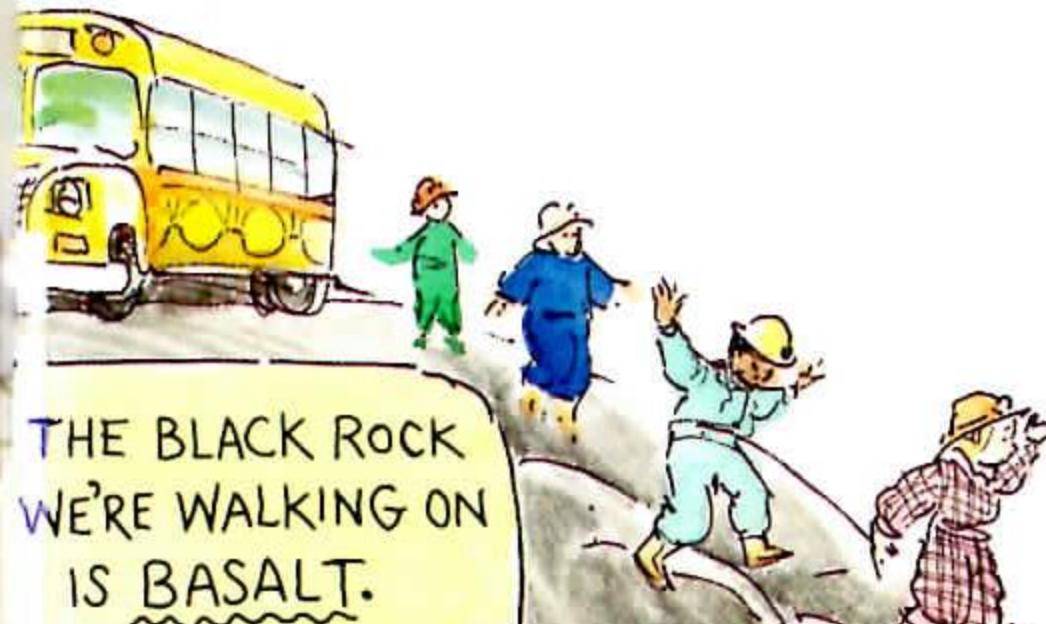


ARE MS. FRIZZLE AND THE KIDS ON A CINDER CONE, A COMPOSITE VOLCANO, OR A SHIELD VOLCANO?



I WANNA GO HOME!

Then we looked around. We had come out on an island in the middle of the ocean! "Isn't this wonderful, class?" said Frizzle. "We've driven right up on a volcanic island!" It didn't look like much. But if Ms. Frizzle was right, the whole island was one big volcano!



THE BLACK ROCK
WE'RE WALKING ON
IS BASALT.

THIS SHINY
VOLCANIC GLASS
IS OBSIDIAN.

HEY! THIS
ROCK FLOATS!

THAT'S PUMICE.
AIR BUBBLES INSIDE
MAKE IT THE LIGHTEST
ROCK THERE IS.

We were nervous, but Ms. Frizzle made us collect some rocks. She said they had all hardened from melted rock that had come out of the volcano. Then, suddenly, we heard rumblings from below.

VOLCANOES MAKE
NEW LAND by Arnold

The material that comes
out of a volcano is
melted rock called lava.
When lava cools, it
hardens into new rock.

In time, soil forms
on the rock and plants
can grow.



We scrambled into the bus.
The Friz turned the ignition key
and stepped on the gas.
Nothing happened.
The bus would not start!
We thought we were goners!



Red-hot lava came streaming out of the volcano.

Some of it shot into the air like a fountain.

Some of it flowed over the land like a river.

Our bus went along with it—right into the sea.



CLASS, WHEN THIS LAVA HARDENS,
IT WILL BE THE NEWEST ROCK
ON EARTH.

WHO CARES?
JUST GET US
OUT OF HERE!

HISSSS

HISSSS

HISSSSSSSS

When the red-hot lava hit the water,
it made a huge cloud of steam.
All we could see was white.
We seemed to be rising
with the steam and floating along.
No one knows how long
we floated in the cloud...



but when it finally cleared,
we were back in the school parking lot.



It had been a weird trip,
but we *did* get
a great rock collection
for our classroom.

ARNOLD,
THAT'S NOT A ROCK
THAT'S
STYROFOAM.

NOT AGAIN!



Rock Collection

by MS. FRIZZLE'S
CLASS

HEY!
I'M NOT
A ROCK!



Phoebe's rock

SHALE



TYPE: Sedimentary
(formed by mud)
USES: Ground up and
mixed with limestone
for cement, brick

Wanda's rock

GRANITE



TYPE: Igneous
USES: Monuments,
buildings, curbstones

MOLLY's rock

BASALT



TYPE: Igneous
(Volcanic)
USES: Road Building

Rachel's rock

OBSIDIAN



TYPE: Igneous
(Volcanic)
USES: Decoration,
Indian Arrowheads

SHIRLEY's ROCK

LIMESTONE



TYPE: Sedimentary
(formed from shells)
USES: Buildings,
chalk, cement,
fertilizer

Amanda Jane's rock

MARBLE



TYPE: Metamorphic
(formed from limestone)
USES: Statues,
monuments, buildings

JOHN's rock

SLATE



TYPE: Metamorphic
(formed from shale)
USES: Roofing tile,
flagstones, chalkboards

Michael's rock

SANDSTONE



TYPE: Sedimentary
(formed by sand)
USES: Buildings,
grindstones

Florrie's rock

PUMICE



TYPE: Igneous
(Volcanic)
USES: Ground-up in
scouring powder

Phil's rock

QUARTZITE



TYPE: Metamorphic
(formed from
sandstone)
USES: Millstones for
grinding grain,
road building



A WORD WITH THE AUTHOR AND THE ARTIST

The first reader of this book called to complain. He said the book was full of mistakes. We recorded the conversation to help you decide which things are true and which were put in to make the story more exciting.

READER: This book is full of mistakes!

AUTHOR: It is not!

ARTIST: Everything in this book is absolutely true and really happened.

READER: What about the beaver lodge on page 7?

AUTHOR: Oh, that. Well, I guess that *would* be too messy in a real classroom.

READER: And the beehive?

ARTIST: That, too. But everything else is fact.

READER: Oh, come *on*! You mean kids can use jackhammers (page 16), and a bus can change into a steam shovel (page 14) and a drill (page 23)?

AUTHOR: Well, er, now that you mention it, that is not really possible.

READER: And do you expect me to believe that a bus can go through the center of the earth (page 28)?

ARTIST: Yes....

AUTHOR: Maybe....

ARTIST: Well, actually, no. The bus couldn't do that, either.

AUTHOR: Even if a bus *could* drill its way through, the distance is so long that the trip would take months, even years.

READER: And what about the heat?

AUTHOR: Okay, okay! It's white-hot in the center of the earth. The bus would be burned up in a minute.

READER: Isn't it kind of ridiculous to say that air-conditioning would help?

AUTHOR: Gee, you're a tough cookie! Okay, you're right. Air-conditioning could not make any difference in that kind of heat.

READER: And the bus could not flow in lava and go up in a cloud of steam (pages 33-34)?

ARTIST: Give us a break! You're right again. That's not true, either.

READER: But you said *everything* was true!

AUTHOR: Everything *else* is. Honest!

READER: Everything else is true? There truly are sedimentary, metamorphic, and igneous rocks?

AUTHOR: Certainly!

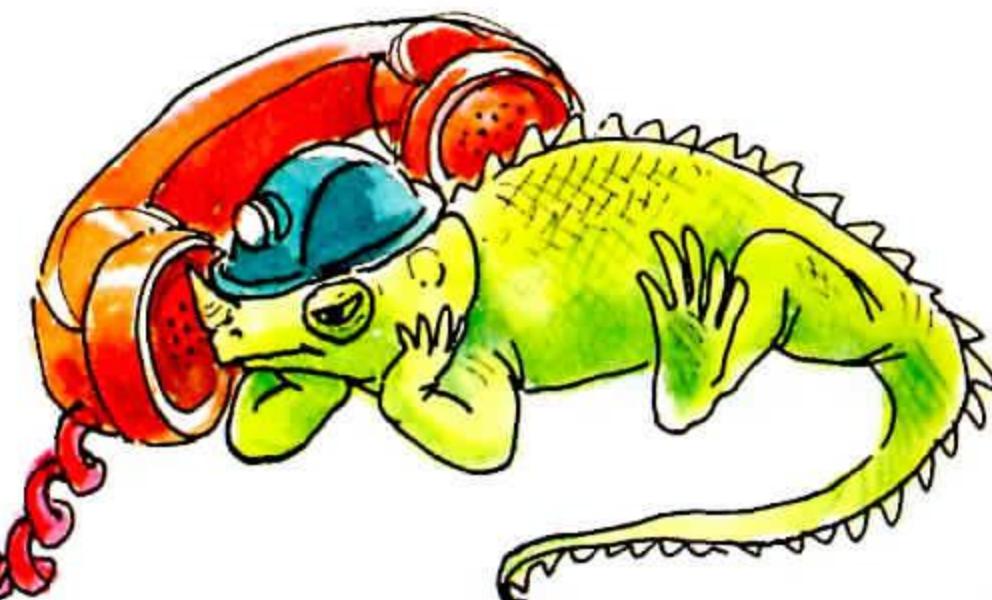
READER: And lava really does harden into new rock?

ARTIST: Oh, yes.

READER: And what about Ms. Frizzle's clothing?

AUTHOR: That *is* hard to believe, but it's true.

ARTIST: She really does dress that way!



HOW TO SAY OUR NEW EARTH SCIENCE WORDS

basalt

(buh-SAWLT)

granite

(GRAN-it)

igneous

(IHG-nee-uhs)

lava

(LAH-vuh)

metamorphic

(met-uh-MAWR-fik)

obsidian

(ahb-SIHDEE-un)

pumice

(PUHM-ih斯)

quartzite

(KWAWRT-site)

sedimentary

(sed-uh-MEN-tar-ee)

stalactite

(stuh-LAK-tite)

Stalagmite

(stuh-LAG-mite)





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